pattern may be implemented in various shapes for performing a function of the sub pattern such as an asymmetrical triangular shape, a quadrangular shape, an elliptical shape, or a trapezoidal shape, etc.

[0057] In some examples, an arrangement interval and an arrangement density of the sub pattern may be changed according to a distance from each light source. For example, in response to luminance of light emitted from the light guide plate being not adjusted to be entirely uniform through the adjustment of the height in the sub pattern, at least one of the arrangement interval and the arrangement density of the sub pattern may be additionally adjusted.

[0058] According to another exemplary embodiment, the main pattern may be configured in such a manner that a position of the sub pattern is shifted in a crosstalk occurrence region.

[0059] For example, the main pattern may be inclined to a preset angle, and the main pattern may be configured such that a sub pattern located in a crosstalk occurrence region is shifted to the left or right by a preset width with the preset angle.

[0060] According to an exemplary embodiment, the main pattern may be inclined to a preset angle, and the main pattern may be configured to be tilted to an angle different from a tilted angle of a sub pattern such that the sub pattern located in the crosstalk occurrence region has continuity with a sub pattern located in continuity with at least one of an upper side and a lower side of the sub pattern.

[0061] The crosstalk occurrence region may be a region calculated based on positions in which a plurality of image views having different view points are displayed on the display panel.

[0062] The drawing at the right of FIG. 4 is an enlarged cross-sectional view illustrating a portion of the main pattern. That is, the drawing at the right of FIG. 4 is a cross-sectional view of the light guide plate taken in a Y-axis direction. As illustrated in FIG. 4, the plurality of sub patterns constituting the main pattern may have the heights which are increased toward the central region of the light guide plate from the edge regions of the light guide plate close to the light sources. Accordingly, the luminance of the light emitted from the light guide plate for 3D may be uniform.

[0063] FIG. 5 is a drawing illustrating an operation of a 3D image display apparatus, according to an exemplary embodiment.

[0064] The autostereoscopic 3D image display apparatus may provide a 3D image through a viewing area separation unit tilted by a preset angle as illustrated in FIG. 5 and a display panel configured to display a multiview image.

[0065] The multiview image displayed in the display panel may be provided by arranging sub pixel values constituting the plurality of image views having the different viewpoints on the display panel in a preset pattern. The viewing area separation unit may be the main pattern in the above-described structure. However, as illustrated in FIG. 6, the viewing area separation unit may be a lenticular lens 612 or a parallax barrier in a display panel structure in which the lenticular lens or the parallax barrier is disposed in front of a display panel 611. If the display panel 611 is an LCD panel, a backlight 613 may be included. If the display panel is a self-emissive display panel, such as an organic light emitting diode (OLED) panel, the backlight 613 may not be included.

[0066] The crosstalk occurrence region may be estimated based on arrangement positions of the plurality of image views, i.e., the sub pixel values constituting the plurality of image views and a tilted angle of the viewing area separation unit. According to an exemplary embodiment, the shape of the lenticular lens, the parallax barrier, or the main pattern of the light guide pattern may be changed to minimize the crosstalk in the crosstalk occurrence region. Hereinafter, for ease of description, the example in which the shape of the main pattern is changed in the structure using the light guide plate in which the main pattern is formed will be described.

[0067] FIGS. 7 and 8 are diagrams illustrating an example of changing a shape of a main pattern to minimize crosstalk according to another exemplary embodiment.

[0068] As illustrated in FIG. 7, the crosstalk occurrence region may be minimized by configuring the main pattern of the light guide plate for 3D in such a manner that sub patterns located in crosstalk occurrence regions 711 and 712 are shifted left or right to appropriate positions.

[0069] As illustrated in FIG. 8, a height C and a width W of a region to be shifted left or right may be a height and a width of a region in which a neighboring viewpoint is viewed, i.e., the crosstalk occurrence region, and the height C and the width W of the region may be implemented to not deviate from the maximum width of the main pattern of the light guide plate for 3D. This is because if a viewing position is moved above and below when a left or right moving width of the sub pattern is larger than the width of the main pattern, parallax may occur. Thus, neighboring viewpoint interference in a specific region may be further increased.

[0070] FIGS. 9 and 10 are diagrams illustrating another example of changing a shape of a main pattern to minimize crosstalk according to another exemplary embodiment.

[0071] As illustrated in FIG. 9, a main pattern may be implemented in such a manner that the first sub pattern located in the crosstalk occurrence region maintains the continuity with a second pattern located in continuity with at least one of an upper side and a lower side of the first sub pattern to a longitudinal direction and is tilted to an angle different from a tilted angle of the second pattern.

[0072] The main pattern may be implemented in such a manner that the first sub pattern tilted by a first angle (e.g., a) and the second sub pattern tilted by a second angle (e.g., 0) different from the first angle may be alternately arranged with the continuity to each other.

[0073] In some examples, a pattern mask for forming a main pattern may be formed as illustrated in FIGS. 9 and 10, and the main pattern may be formed using the pattern mask.

[0074] FIG. 11 is a block diagram illustrating a configuration of a 3D image display apparatus according to an exemplary embodiment.

[0075] Referring to FIG. 11, the 3D image display apparatus 300 may include an image input unit 310 (e.g., image input interface), a display 320, and a processor 330.

[0076] The 3D image display apparatuses 300 may be implemented with various types of display apparatuses, e.g., a TV, a monitor, a personal computer (PC), a kiosk, a tablet PC, an electronic photo frame, and/or a portable phone.

[0077] An image input unit 310 may receive an image. For example, the image input unit 310 may receive the image from an external storage medium, a broadcasting station, and various external apparatuses, such as a web server. The input image may be any one among a single view image, a stereoscopic image, and a multiview image. The single view